An **Pediatric Parotidectomy: a 20-Year Experience at a Single Institution**

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INTRODUCTION

The differential diagnosis for a parotid mass or lesion in pediatric patients is extensive. Unlike in adults, pediatric parotidectomy is commonly performed for inflammatory causes. Pathologies vary, but the most common benign non-inflammatory lesions are congenital abnormalities (such as lymphangioma or first branchial cleft anomaly) and pleomorphic adenoma. Malignant tumors are infrequent, with mucoepidermoid carcinoma being the most common.

Characterization of parotid surgery in children is challenging due to the diverse pathologies represented and to the relative infrequency of the procedure. In addition, there are wide variations in available treatment paradigms. Moreover, the role and extent of parotid surgery in the management of atypical mycobacterial infections involving the parotid gland is somewhat controversial.

Our objective was to examine the characteristics and outcomes of pediatric patients who underwent parotidectomy at our institution.

MATERIALS AND METHODS

Institutional Review Board (IRB) approval was obtained to analyze the medical records of all pediatric patients (<18 years) who underwent parotidectomy at the University of Wisconsin between 1994 and 2013. The following data were extracted: sex, age, presenting signs and symptoms, initial radiographic findings, surgical pathology, tumor size (both radiographic and surgical pathologic), sidedness, post-operative complications, facial nerve weakness, body mass index (BMI), and recurrence after initial procedure. Patients were placed into 2 groups: infectious or inflammatory lesions and non-inflammatory lesions. Non-inflammatory lesions were categorized as either benign or malignant. Patient presentation was characterized as either asymptomatic or symptomatic (pain, skin changes, parotitis etc.). All statistical analyses were two-sided and were carried out using JMP Pro v.11.0.0. A p-value < 0.05 was considered statistically significant.

RESULTS

Electronic Medical Record Review and Patient Selection

A total of 42 patients met criteria. Twenty-two patients were diagnosed with a non-inflammatory parotid gland tumors based on surgical pathology. Of these, 68.2% had benign disease (n=15) and 31.8% had malignant neoplasms (n=7). 36.4% of the non-inflammatory masses were primary parotid neoplasms (n=8). All other patients (n=20) had infectious or inflammatory lesions.

Distribution of Histological Subtypes

Surgical pathology revealed 20 patients (48%) with infectious or inflammatory lesions, 15 patients (36%) with benign lesions, and 7 patients (17%) with malignant lesions. Of all non-inflammatory lesions (n=22), lymphangioma and pleomorphic adenoma were the most common, representing 27.2% (n=6) and 22.7% (n=5), respectively, of all tumors. This was followed by simple parotid cysts at 9.1% (n=2). There was one of each of the following benign tumors: dermoid cyst, branchial cleft anomaly, and Langerhans histiocytosis. There was one of each of the following malignant tumor: mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma, lymphoma, leukemia, and melanoma. Of the inflammatory masses (n=20), 11 (26.2%) had nontuberculous mycobacterium, 5 (11.9%) had hyperplastic lymphadenopathy, 4 (9.5%) had pathology consistent with sialadenitis, and 1 (2.4%) had non-caseating granuloma.

Patient and Tumor Characteristics

Patient characteristics were evaluated to determine their relationship to the diagnosis of a primary parotid malignancy. Overall, there were 19 (45.2%) males and 23 (54.8%) females. BMI data were available on 17 patients, with the mean being 19.52. Average age was 8.1 years (range 13 months to 17 years). 18 patients had right-sided lesions, 24 patients had left-sided lesions. 33.3% of patients (n=14) were asymptomatic at presentation, while 66.7% of patients (n=28) were symptomatic. For those with symptoms, 57% (n=16) had recurrent parotitis, 17.9% (n=5) had pain, 17.9% (n=5) had skin abnormalities, 3.6% (n=1) had pre-operative facial weakness, and 3.6% (n=1) had first bite syndrome with pain. Two patients had recurrence, one with granulomatous infection and one with adenoid cystic carcinoma. Presentation was compared between the infectious and inflammatory and non-infectious groups and there was statistical significance showing patients with infectious or inflammatory lesions more often present symptomatically (p=0.0232).

FNA was recorded in 7 patients (16.7%). The diagnostic accuracy was 71.4%. Two patients had non diagnostic FNAs, one of which was an adenoid cystic carcinoma and the other a dermoid cyst. Of the diagnostic FNAs, two were pleomorphic adenoma and one of each of mucoepidermoid carcinoma, atypical mycobacterium, and chronic inflammation. Initial imaging was performed preoperatively in 29 patients (69%). Of these, 16 were CT (55.2%), 12 were MRI (41.4%), and 1 was PET CT (3.4%).

Post-Operative Symptoms

Status of the facial nerve was recorded in 40 patents post-operatively. Facial paresis occurred in 19 (47.5%) patients. This included 16 inflammatory lesions (40%) and 3 noninflammatory lesions (7.5%). Weakness occurred more frequently in inflammatory lesions (p=0.01). Of all patients with facial paresis, 11 (27.5%) had only mild marginal mandibular weakness. Of these, 9 patients (22.5%) had infectious or inflammatory lesions. Permanent weakness occurred in 2 patients (5%).

Recovery times ranged from 1 month to greater than 1 year. No patients had complete paralysis and only 2 patients (5%) had House-Brackman grade III or worse following initial resection. One patient with permanent weakness had intentional facial nerve sacrifice for gross tumor invasion of adenoid cystic carcinoma (complete eye closure was achieved at 1 year). Additional complications included facial pain (3 patients), wound infection, seroma, hematoma, and Frey syndrome (one each).

DISCUSSION

Our study presents all patients at a single institution who underwent pediatric parotidectomy. We analyzed patient and tumor characteristics that could be related both to pathology and to post-operative outcomes. We found that 20 patients (48%) had infectious or inflammatory disease. This is consistent with previously described rates which range from 33 – 59%. In our study, 55% (n=11) had atypical mycobacterium, this was the most common pathology overall. Of patients with non-inflammatory pathology (n=22), 72.7% of patients (n=16) had benign disease and 28.3% of patients (n=6) had malignant disease. The percentage of malignant disease is similar to the reported percentage for non-inflammatory lesions of 25.3%.

There was a slight preponderance of female patients with a 0.83:1 male to female ratio. The mean age of 8.1 years falls within the range of 5-14 years described in previous studies. Most patients (66.7%) presented with a symptomatic, palpable mass, which is contrary to adult patients who most often present with an asymptomatic, palpable mass. This appears consistent with the relatively higher proportion of patients with inflammatory etiologies. Infectious and inflammatory lesions were more likely to present symptomatically than noninflammatory lesions (p=0.023).

Post-operative complications were almost uniformly related to facial nerve weakness; however, there were 3 patients (7.1%) who developed chronic facial pain which persisted at least 6 months after parotidectomy. Patients who had perifacial pain tended to be older.

Post-operative facial nerve function data were available on 40 patients. Of these, 19 (47.5%) had some degree of facial weakness. Other papers have described facial nerve weakness from 4.5 to 23%. Overall, permanent weakness only occurred in 2 patients (5%). In similar patient populations, facial nerve weakness ranges in the literature from 0 to 6.7%. Of patients with transient weakness, 16 patients had inflammatory or infectious lesions (40%). In the literature, similar patients had rates from 14 – 31.8%. In patients who had non-inflammatory lesions the rate of FN paralysis was much lower, 14.2%. As mentioned, post-operative facial nerve weakness was seen significantly more in the inflammatory group (p=0.01). We believe that this is the first time this has been described in the literature.

There are limitations to this work. First, this was carried out in a retrospective fashion, and only patients with surgical pathology reports could be included. This means all patients who underwent other forms of treatment or observation were excluded. Cytological and histological diagnoses rendered by the pathologist could have been influenced by inter-observer variability.

We believe that pediatric parotidectomy can effectively be described for either infectious or inflammatory causes or non-inflammatory causes. We found that parotidectomy for infectious or inflammatory causes are more likely to present symptomatically, which could be expected, but also that they are more likely to have transient facial nerve weakness post operatively. This point is important for patient counselling in a very difficult to manage disease process.

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